Pittsburgh, Pa.—Precipitation during February was light, but was sufficient during the second and third weeks to create considerable run-off. The smaller tributaries were running strong for several days, and the Ohio at Pittsburgh rose to a stage of 14.4 feet on the 21st—the highest stage since April 23, 1930. Wells, springs, and some small streams that dried up during the fall are running again.

Cincinnati, Ohio.—For the last three months—November, December, and January—the rainfall in and around Cincinnati actually was less than the normal January rainfall alone. This emphasizes the increasing gravity of the situation.

Farmers right now are hauling more water for their suffering stock, and for themselves, than they hauled at the peak of the drought last summer.

Hamilton County commissioners have been informed within the last week that tank wagons are carrying 50,000 gallons of water a day from the county pipe lines to farms and residences without water. An increase to 60,000 gallons daily is imminent.

Memphis, Tenn.—Rivers here are already feeling the effects of the dry weather. The Mississippi River is the lowest in the past 12 years and cargo barges are having difficulty in negotiating narrows and shallows. A majority of the river firms have been loading their barges only to half capacity in order to insure swift and safe trips.

Table of flood stages in February, 1931

River and station	Flood stage	Above flood stage—dates		Crest	
		From—	To—	Stage	Date
MISSISSIPPI DRAINAGE					
	Feet			*Feet*	
Black: Black Rock, Ark	14.0	9	10	15.6	10
White: Batesville, Ark	23.0	9	10	23.8	10
Petit Jean: Danville, Ark	20.0	10	11	20.8	11
		15	16	20.7	15
		24	25	21.3	24
WEST GULF DRAINAGE					
Trinity:					
Dallas, Tex	28.0	25	26	29.4	26
Liberty, Tex	25.0	12	12	25.2	12
PACIFIC DRAINAGE					
Gila: Kelvin, Ariz	5.0	15	16	6.5	16
Salt: Phoenix, Ariz	5.0	15	16	6.2	15

WEATHER OF THE ATLANTIC AND PACIFIC OCEANS

NORTH ATLANTIC OCEAN

By F. A. YOUNG

February is normally one of the stormiest months of the year over the North Atlantic, and the conditions during the current month could not be called exceptional, although there were a number of severe disturbances that will be referred to later. The number of days with gales was not far from normal west of the fortieth meridian, north of the thirtieth parallel, and somewhat below over the middle and eastern sections of the steamer lanes. The North Atlantic HIGH was unusually well developed, as indicated by the large positive departure at Horta, shown in Table 1.

Fog was much more prevalent than during the preceding two months, and the number of days on which it was reported in different localities is as follows. Over the Grand Banks, from 6 to 12 days; along the American coast, between the thirtieth and forty-fifth parallels, from 2 to 5 days; over the steamer lanes between the twentieth and forty-fifth meridians, from 1 to 5 days; along the European coast, from 1 to 3 days; in the Gulf of Mexico, from 1 to 2 days.

TABLE 1.—*Averages, departures, and extremes of atmospheric pressure at sea level, 8 a. m. (seventy-fifth meridian), North Atlantic Ocean February, 1931*

Stations	Average pressure	Departure	Highest	Date	Lowest	Date
	Inches	*Inch*	*Inches*		*Inches*	
Julianehaab, Greenland	29.66	(1)	30.46	27th	29.06	3d.
Belle Isle, Newfoundland	29.87	+0.12	30.66	19th	29.34	28th.
Halifax, Nova Scotia	29.87	−0.04	30.52	8th	29.32	23d.
Nantucket	29.96	−0.04	30.42	7th	29.64	14th.
Hatteras	30.07	−0.04	30.30	12th	29.82	14th.
Key West	30.03	−0.07	30.20	7th	29.82	25th.
New Orleans	30.07	−0.06	30.30	15th	29.76	24th.
Cape Gracias, Nicaragua	29.93	−0.06	29.98	13th [4]	29.86	16th.
Turks Island	30.04	−0.04	30.16	7th [4]	29.84	4th.
Bermuda	29.95	−0.17	30.38	13th	29.30	26th.
Horta, Azores	30.41	+0.28	30.78	12th	30.08	22d.
Lerwick, Shetland Islands	29.54	−0.18	30.32	3d	28.91	20th.
Valencia, Ireland	29.98	+0.08	30.32	3d [4]	29.59	8th.
London	29.92	−0.08	30.37	24th	29.22	16th.

[1] No normal available.
[2] From normal shown on Hydrographic Office Pilot Charts, based on observations at Greenwich mean noon, or 7 a. m., seventy-fifth meridian time.
[3] From normals based on 8 a. m. observations.
[4] And on other date or dates.

On the 1st a fairly deep depression was central near the south coast of Greenland, with a secondary LOW over the North Sea, and moderate gales prevailed over the central section of the steamer lanes and off the west coasts of France and England.

On the 3d there was evidently a redevelopment of the Greenland LOW, and on that date moderate to strong westerly gales occurred in the southerly quadrants. This LOW moved slowly eastward, and on the 5th was central near 52° N., 22° W.

A moderate depression that on the 7th was over the eastern section of the steamer lanes developed into a severe disturbance, as on the 8th vessels near the center reported westerly winds of hurricane force. On the 9th and 10th stormy conditions continued over the central section of the ocean, and on the latter date as well as on the 11th northerly gales were reported west of the seventieth meridian, between the twenty-fifth and fortieth parallels, and from the 10th to 12th heavy weather was also encountered off the west coast of Europe.

On the 13th and 14th moderate conditions prevailed over the ocean as a whole, with the exception of gales over a limited area about 500 miles east of the Bermudas, while on the 13th land stations on the British Isles reported northerly winds of force 7 and 8.

On the 15th Sydney, Nova Scotia, was near the center of a well-developed LOW, and on the same date a secondary was over the Bermudas, while severe gales were encountered by vessels in the intermediate region. According to press reports three vessels were beached, one sunk, and others damaged in the vicinity of Hampton Roads during the storm.

On the 16th and 17th strong to whole northerly gales again prevailed along the coast of Europe, the storm area extending from the forty-fifth to fifty-seventh parallels, while moderate conditions were the rule over the remainder of the ocean.

On the 18th a depression was central about midway between the Azores and Bermudas that increased in intensity as it moved slowly eastward, and on the 19th and 20th gales of force 8 to 10 were encountered by vessels between the thirtieth and fortieth meridians. On the 20th northwesterly gales also occurred over the eastern section of the northern steamer lanes.

Charts VIII and IX show the conditions on the 22d and 23d, respectively, when a very severe and extensive disturbance prevailed over the western section of the ocean. By the 24th this storm had decreased considerably both in extent and intensity, and on the 25th moderate weather prevailed generally.

On the 26th Bermuda was near the center of a LOW that developed into a severe disturbance as shown on Charts X and XI for the 27th and 28th, respectively.

NOTES.—Canadian steamship *City of Vancouver*, Capt. M. Buchanan; Observer, W. A. Kent; from Antwerp to Canal Zone; Feb. 4, 1.45 A. T. S. in 14° 52′ N., 72° 44′ W. Sea appeared to have on a fine layer of dust with occasional irregular lines of what appeared to be yellow sand. These stretched approximately in a north and south direction and extended as far as could be seen on both sides. These conditions continued until about 3 p. m. in 14° 45′ N., 72° 53′ W. Course, S. 52° W.; wind W. S. W., 2; sea slight; swell, easterly, slight; barometer, 29.94 inches; thermometer, 83°; sea temperature, 79.5°.

Mr. C. Desmond, second officer and observer, Honduran steamship *Cuyamapa*, Capt. N. Christiansen, reports as follows:

At 19.55 G. M. T. I observed an exceptionally large waterspout several hundred feet high in latitude 30° 58′ N., longitude 77° 18′ W.

It formed very quietly, no confusion or vapor in vicinity except in itself. It ascended in a straight line, or nearly so, towards the sky to a great height. When heavy dark blue sky lowered in a cone-shape form until it met the ascending water or vapor.

In the center of the globular-shaped moisture, a very light tube formed and continued for 20 minutes. Then it separated at an altitude of a thousand feet, lowered to approximately 500 feet, and took the form of a burning mountain.

With great force these fumes took altitude. The spout, later losing its energy turned to a whirlwind of great interest, about 5 to 10 feet above the surface.

Later heavy showers of rain fell; the wind increased to force 5, veering to the west and northwest, that had been southerly. Barometer, 29.58; air, 66° F.; surface temperature of sea water 71°.

OCEAN GALES AND STORMS, FEBRUARY, 1931

Vessel	Voyage		Position at time of lowest barometer		Gale began	Time of lowest barometer	Gale ended	Lowest barometer	Direction of wind when gale began	Direction and force of wind at time of lowest barometer	Direction of wind when gale ended	Highest force of wind and direction	Shifts of wind near time of lowest barometer
	From—	To—	Latitude	Longitude									
NORTH ATLANTIC OCEAN			° ′	° ′				*Inches*					
Frederik VIII, Dan. S. S.	Oslo	Halifax	56 35 N	28 20 W	Feb. 2	Mdt, 2	Feb. 4	29.47	SSE	SSE, 8	WSW	WSW, 10	SSE-S-SSW.
Milwaukee, Ger. M. S.	New York	Galway	49 45 N	30 00 W	Feb. 3	10 p, 4	Feb. 5	29.47	E	SSW, 10	NW	WNW, 11	E-S-W-NW.
Carlsholm, Swed. S. S.	Fair Island Strait.	Boston	57 59 N	22 24 W	Feb. 4	7 a, 5	do	29.19	W	SSW, 6	WSW	WSW, 12	SE-SW-N.
Ala, Am. S. S.	Antwerp	New York	39 14 N	55 50 W	Feb. 5	1 p, 6	Feb. 6	29.59	S	SSW, 8	NW	S, 9	S-W-NW.
Sinaia, Fr. S. S.	Gibraltar	Providence	39 00 N	42 05 W	do	—, 7	Feb. 8	29.60	SW	Calm	NNE	SSW, 10	
Carlsholm, Sweden	Fair Island Strait.	Boston	54 20 N	36 08 W	Feb. 8	8 a, 8	do	28.70	WSW	WSW, 11	W	WSW, 12	SW-W-NW.
Jean Jadot, Belg. S. S.	New York	Antwerp	41 05 N	50 28 W	do	3 a, 8	Feb. 9	29.96	NW	NW, 9	NW	NW, 10	
Sagaporack, Am. S.S.	Norway	Newport News.	58 28 N	19 17 W	do	Noon, 8	do	28.88	SW	SW, 8	SW	—, 10	SW-WSW.
Santa Marta, Am. S. S.	Canal Zone	New York	33 11 N	74 30 W	Feb. 9	4 a, 10	Feb. 10	29.66	WNW	WNW, 9	NW	—, 9	W-WNW-NW
Boston City, Br. S. S.	New York	Cardiff	51 22 N	3 20 W	Feb. 10	8 p, 12	Feb. 15	29.65	W	NW, 5	NW	WNW, 10	Steady.
United States, Dan. S. S.	Oslo	Halifax	58 08 N	16 30 W	Feb. 14	2 p, 15	Feb. 16	29.38	SSW	NW, 9	N	WNW, 10	SW-W-NW.
Carplaka, Am. S. S.	Gothenburg	Portland, Me.	58 38 N	6 53 W	Feb. 15	4 a, 16	Feb. 17	28.97	W	W, 5	N	N, 10	W-N.
Asia, Dan. M. S.	St. Thomas	Hamburg	33 40 N	41 30 W	Feb. 17	Noon, 17	Feb. 20	30.02	SSE	SSE, 8	S	SSE, 11	S-SSE-SSW.
Carplaka, Am. S. S.	Gothenburg	Portland, Me.	57 19 N	26 30 W	Feb. 18	8 p, 19	do	29.25	W	W, 10	W	W, 10	W-NW.
Liberty, Am. S. S.	Havre	New York	36 14 N	61 58 W	Feb. 21	Mdt, 21	Feb. 23	28.95	WNW	WNW, 4	NW	NW, 12	Steady.
Exmouth, Am. S. S.	Gibraltar	do	36 10 N	53 00 W	do	5 p, 22	Feb. 24	29.04	S	WSW, 11	WNW	—, 11	S-SW.
West Hika, Am. S. S.	Hamburg	Gulfport	30 58 N	62 55 W	do	Noon, 26	Feb. 27	29.17	W	W, 8	NNW	NW, 11	
Cabo Espartel, Span. S. S.	Seville	New York	35 20 N	51 30 W	Feb. 27	1 a, 27	Mar. 1	28.89	WSW	WSW, 6	WNW	NW, 10	
Singkeep, Du. S. S.	Oran	Boston	37 04 N	44 00 W	Feb. 26.	7 p, 27	Feb. 28	29.05	SSE	SW, 10	W	—, 11	SW-W.
Wyneric, Br. S. S.	Curacao	Liverpool	38 27 N	40 35 W	do	3 a, 28	do	29.45	SE	SSW, 10	WSW	SE, 11	SSE-S-SW.
President Harrison, Am. S. S.	Gibraltar	New York	42 55 N	50 15 W	Feb. 28	1 a, 28	Mar. 2	28.83	WNW	WNW, 8	NW	NW, 12	
NORTH PACIFIC OCEAN													
Michigan, Am. S. S.	Shanghai	San Francisco	48 00 N	171 15 E	Jan. 31	Noon, 31	Feb. 1	28.03	ENE	SSW, 5	W	WSW, 9	SSE-S-SSW.
Arizona Maru, Jap. S. S.	Seattle	Yokohama	52 07 N	154 42 W	Feb. 1	4 a, 2	Feb. 2	29.17	SSW	SSW, 9	SW	SSW, 9	SSW-S-SW.
Hakutatsu Maru, Jap. S. S.	Miike	San Pedro	45 25 N	158 20 E	do	5 a, 3	Feb. 4	29.22	S	SE, 8	SW	NW, 11	SE-SW.
Do	do	do	48 53 N	176 15 W	Feb. 7	10 a, 7	Feb. 8	28.82	SSE	SSW, 8	SW	WSW, 11	SSW-SW.
Laurel, Swed. M. S.	Port Adelaide	San Francisco	31 37 N	131 50 W	Feb. 1	—, 3	Feb. 6	29.74	N	N, 10	NNW	N, 11	N-NNW.
William Penn, Am. M. S.	Iloilo	San Pedro	33 59 N	153 20 W	Feb. 2	3 p, 2	Feb. 2	29.66	SSE	SSE, 10	S	S, 10	SSE-S.
San Diego Maru, Jap. M. S.	Kudamatsu	Los Angeles	37 10 N	157 05 E	do	4 p. 2	do	29.40	E	E, 9	E	E, 9	SSE-E.
San Luis Maru, Jap. M. S.	Elwood	Kudamatsu	30 02 N	179 50 W	do	8 p, 2	Feb. 3	29.31	S	SW, 7	WNW	W, 9	S-SW-W.
Bessemer City, Am. S.S.	Mobile	Los Angeles	14 04 N	96 15 W	Feb. 3	4 p, 4	Feb. 4	29.95	N	ENE, 9	ENE	N, 11	NE-ENE.
Ryujin Maru, Jap. S. S.	Vancouver	Shanghai	53 05 N	157 15 W	Feb. 2	2 a, 2	Feb. 2	28.86	S	SSW, 9	SW	SSW, 9	S-SW.
Do	do	do	50 28 N	174 55 E	Feb. 8	11 a, 8	Feb. 8	28.82	NE	NNW, 9	NW	NNW, 9	NE-WNW.
Ryoyo Maru, Jap. M. S.	Yokohama	San Francisco	47 25 N	152 10 W	Feb. 4	4 a, 5	Feb. 5	29.11	ESE	ESE	SSW	S, 9	
Kinai Maru, Jap. M. S.	do	Los Angeles	43 40 N	164 00 W	Feb. 7	8 a, 9	Feb. 9	28.97	NE	W, 9	W	W, 9	NW-W.
Pres. Wilson, Am. S. S.	Honolulu	Kobe	30 34 N	143 45 E	Feb. 10	5 p, 10	Feb. 10	29.69	SW	SW, 9	NW	SW, 9	SW-W-NW.
Havana Maru, Jap. S. S.	Otaru	San Francisco	49 11 N	171 35 W	Feb. 12	10 p, 12	Feb. 14	28.44	SE	SSW, 9	WSW	SW, 10	S-SSW-SW.
Forresbank, Br. M. S.	San Pedro	Yokohama	32 43 N	176 18 W	Feb. 15	11 a, 16	Feb. 16	29.74	SSW	SW, 8	WNW	SW, 9	WSW-SW-W.
Mojave, Am. S. S.	Yokohama	San Pedro	39 32 N	174 30 E	Feb. 16	1 a, 18	Feb. 19	29.21	NW	S, 10	W	S, 10	4 points.
Tyndareus, Br. S. S.	do	Victoria	49 40 N	163 55 W	Feb. 17	10 a, 18	Feb. 20	28.07	SE	WSW, 9	W	SW, 9	S-WSW-W.
Forresbank, Br. M. S.	San Pedro	Yokohama	82 23 N	165 51 E	Feb. 18	2 p, 19	Feb. 19	29.59	SW	SW, 8	W	WSW, 9	SW-WSW.
Hakushika Maru, Jap. S. S.	Mobile	Coos Bay	31 54 N	119 28 W	Feb. 19	Mdt, 20	Feb. 21	29.98	NW	WNW, 9	NNW	WNW, 9	Steady.
Do	do	do	38 50 N	124 40 W	Feb. 23	2 p, 23	Feb. 24	30.03	NNW	NNW	N	NNW, 9	Do.
Fukuyo Maru, Jap. S. S.	Japan	Vancouver	48 37 N	178 03 E	Feb. 22	5 a, 23	do	29.49	ESE	NW, 3	W	W, 11	
Batoe, Du. S. S.	Soerabaia	Portland	43 23 N	156 20 W	Feb. 24	8 p, 24	Feb. 25	29.66	S	SW, 8	WNW	W, 10	S-SW-WNW.
Golden Sun, Am. S. S.	Otaru	San Francisco	45 17 N	168 55 E	Feb. 25	8 p, 25	Feb. 27	29.34	ESE	SSE, 7	N	SE, 10	SE-W.

NORTH PACIFIC OCEAN

By WILLIS E. HURD

Atmospheric pressure.—Over the eastern half of the North Pacific Ocean, except the southeastern part, particularly along the California coast, atmospheric pressure rose in February, following the extraordinarily low barometer covering the upper waters during January, although still below the normal from Juneau westward into the Aleutians. The Aleutian cyclone, central in January near Dutch Harbor, fluctuated to the eastward in February, with an average near-central pressure of 29.23 inches at Kodiak. In this general region the cyclonic activity was greatest and the pressure lowest during the early half of the month.